



A STUDY ON THE PREDICTION OF FINANCIAL DISTRESS OF SELECTED CEMENT COMPANIES IN INDIA

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Abstract

This research examines the prediction of financial distress of the selected cement companies in India. An attempt has been made to understand the influence of capital structure (use of financial leverage) to predict the financial distress of the selected cement companies in India. Using the Capitaline Plus database developed the BSE, data were collected from the year 2009-2010 to 2013-2014 for the cement manufacturing companies. Sickness is caused by unfavorable external environment and managerial deficiencies. Financial deficiencies such as wrong capital structure, bad investment decisions, weak management control, poor working capital management¹. A company is financially distressed whenever its EBIT is less than its interest expenses². The objectives of the study are to measure the financial leverage of selected cement companies in India and to find out whether the greater the level of debt and the larger the debt servicing burden associated with it, has the higher the probability of financial distress. The companies included in the study were ACC Ltd (ACC), KCP Ltd (KCP), India Cements Ltd(IC), Prism Cements Ltd (PC) and Madras Cement Ltd (RC). ANOVA was used to analyze the data. ACC, IC and RC have enough potential to service its debts.KCP and PC has a probability of financial distress as the EBIT is low and the interest coverage ratio is high.

Key Words: *Capital Structure, Debt, Equity, Financial Distress, Financial Leverage.*

INTRODUCTION

The Indian cement industry is the second largest market after China accounting for about 8% of the total global production. It had a total capacity of over 360 metric tons (MT) as of financial year ended 2013-14. Cement industry is one of the key industries in India. The production and consumption of cement to a large extent indicate country's progress. It is a capital intensive industry. Cement is a cyclical commodity with a high correlation with GDP. The housing sector is the biggest demand driver of cement, accounting for about 67% of the total consumption. The other major consumers of cement include infrastructure (13%), commercial construction (11%) and industrial construction (9%).

The Indian cement industry grew at a commendable rate in the previous decade, registering a compounded growth of about 8%. However, the growth slowed down in the period 2011 to 2013 when cement consumption grew at an average rate of 4%. Moreover, the per capita consumption of cement in India still remains substantially low at about 192 kg when compared with the world average which stands at about 365 kg (excluding China). This underlines the tremendous scope for growth in the Indian cement industry in the long term. Cement, being a bulk commodity, is a freight intensive industry and transporting it over long distances can prove to be uneconomical. This has resulted in cement being largely a regional play with the industry divided into five main regions viz. north, south, west, east and the central region. The Southern region of India has the highest installed capacity, accounting for about one-third of the country's total installed cement capacity. During the financial year 2013-14 (FY14), India's cement industry grew by 3-4% year-on-year (YoY). The subdued growth was mainly attributable to slowdown in construction activities, regulatory delays in infrastructural projects, high interest rates, prolonged monsoons and natural disasters such as floods and cyclone in some parts of the country. The industry witnessed high operating costs, including all major cost heads such as raw materials, energy and freight. The steep depreciation of the rupee and hike in rail freight and diesel prices further aggravated the concerns.

Cement demand is closely linked to the overall economic growth, particularly the housing and infrastructure sector. Given the Modi government's thrust on housing and infrastructure development, cement demand is expected to pick up in the coming times. The weakness in the international crude oil prices and other commodities should help bring costs under control and improve profitability of the sector. If inflation comes under control, a likely lowering of interest rates would be a big positive for the cement sector. While temporary challenges remain in the form of excess capacity, the long term drivers for cement demand remain intact. Higher government spending on infrastructure, robust growth in rural housing and rising per capita incomes are likely to augur well for the cement industry. While temporary challenges remain in the form of excess capacity, the long term drivers for cement demand remain intact. Higher government spending on infrastructure, robust growth in rural housing and rising per capita incomes are likely to augur well for the cement industry³.

REVIEW OF LITERATURE

William H Beaver (1966)⁴ defined failure as the inability of a firm to meet its financial obligations as they mature. His analysis suggested that many of the ratios employed showed the power to signal an impending failure. The ratios of failed

firms differed significantly from those of the non-failed firms. Further, they deteriorated sharply during the five years prior to failure.

Altman.E.I (1968)⁵ conducted the earliest study using multivariate data analysis on failure ratios as independent corporate failures. The study used sixty six corporations from manufacturing industries comprising of bankrupt and non bankrupt firms and 22 ratios from five categories, namely profitability, leverage, solvency and activity. Five ratios were finally selected for their performance in the prediction of corporate bankruptcy and the derived model correctly classified 95 percent of total sample (correctly classifying 94 percent as bankrupt firms) one-year prior to bankruptcy. The percentage of accuracy declined with increasing number of years before bankruptcy.

Gordon Donaldson (1969)⁶ suggested similar type of analysis. He argued that a firm will normally be able to meet its fixed obligations in terms of interest as well as repayment of Principal. It is only in the adverse circumstances that the firms will not be able to maintain their ability to meet contractual obligations and would be exposed to the risk of bankruptcy or the extreme form of risk of financial distress. He terms these as recession conditions. To examine the impact of alternative debt policies on the risk of bankruptcy.

L.C. Gupta (1979)⁷, in a study done with Indian data, attempted to distinguish sick and non-sick companies on the basis of financial ratios. His major focus was on a sample of 41 textile companies of which 20 were sick and 21 non-sick to test the predictive power of 63 financial ratios. The ratio which showed a least percentage classification error at the earliest possible time was deemed to have the highest predictive power. The relative predictive power of different financial ratios was determined for each year for the period 1962-1964.

(Thynne, 2006)⁸ Financial leverage involves the substitution of fixed-cost debt for owner's equity in the hope of increasing equity returns. Financial leverage improves financial performance when business financial prospects are good but adversely impact on financial performance when things are going poorly. As a result, increasing the ratio of debt to equity in a company's capital structure implicitly makes the company relatively less solvent and more financially risky than a company without debt. Capital adequacy relates to whether a company has enough capital to finance its planned future operations. If the company's capital is inadequate, then it must either be able to successfully issue new equity, or arrange new debt. The amount of debt a company can successfully absorb and repay from its continuing operations, is normally referred to as the company's debt capacity.

Bardia.S.C.Subash (2012)⁹ conducted an empirical study on two leading steel manufacturing companies of India aimed at predicting financial distress using Altman's Z score model which was based on several financial ratios. This research paper investigated the long term solvency position of the sample companies, by the use of sample companies by the use of a common technique of common size analysis along with the six solvency ratio in conjunction with the statistical technique of hypothesis testing. The paper finally offers some relevant suggestions for improving the solvency position of the selected companies and also to stay away from financial distress.

SIGNIFICANCE OF THE STUDY

Financial distress is of crucial importance in financial management especially in the case of competitive environment. Failure is not an impulsive outcome and it grows constantly in stages. This study hopes to accommodate some important results relevant to authorities and stake holders. The capability to detect potential financial problems at a premature stage is absolutely essential because, it helps to ensure business, financial economic and political environment stability.

STATEMENT OF THE PROBLEM

Financial distress can lead to the problems that can reduce the efficiency of the management. The problems of corporate financial structure have been an important factor in contributing to the financial crisis and leading many corporations to bankruptcy. W.H.Beaver is the one to conduct the earlier study on "Financial Ratio as Predictors of failure" in the year 1966. Altman.E.I "Financial Ratios, Discriminant Analysis and the prediction of Corporate bankruptcy" in the year 1968. L.C.Gupta, "Financial Ratios as forewarning Indicators of sickness" in the year 1979. Many researches related to the prediction of financial distress was based on the financial ratios such as profitability ratios, liquidity ratios and solvency ratios. So, Therefore an attempt has been made to understand the influence of capital structure (use of financial leverage) to predict the financial distress of the selected cement companies in India.

OBJECTIVES

1. To measure the financial leverage of selected cement companies in India.

2. To find out the whether greater the level of debt and the larger the debt servicing burden associated with it, has the higher the probability of financial distress.

DEFINITION OF VARIABLES

All the variables are measured in book values and not in market values because of data limitation. For the analysis various attributes suggested by different theories of capital structure were used in the study. The total debt to equity was used to represent the capital structure in this study. The components of debt-equity ratio are external equities and internal equities. External equities refer to the total outside liabilities and internal equities refer to all the claims of preference shareholders and shareholders holders such as share capital, reserves and surplus. Here the preference capital has not been used because of non-usage of that particular source by majority companies. The commonly used measures of financial leverage are

- 1) Debt Ratio
- 2) Debt-Equity Ratio
- 3) Interest Coverage Ratio
- 4) Interest to EBIT

SCOPE OF THE STUDY

The study focuses in predicting the financial distress of the selected cement companies in India with the use of financial leverage from 2009-2010 to 2013 -2014 for five years.

RESEARCH METHODOLOGY

The financial data required for the study are drawn from the secondary source. The capital line database has been used as principal source. The other relevant data are collected from journals, magazines and websites.

Sampling Design

Companies listed in BSE and for which the data is available for all the five years. The companies included in the study were ACC Ltd (ACC), KCP Ltd (KCP), India Cements Ltd(IC), Prism Cements Ltd (PC) and Madras Cement Ltd (RC).

Period of the Study

The study period is five financial years from 2009-2010 to 2013-2014.

Tools

The tools used for the study were

1. Mean
2. Standard deviation
3. ANOVA

Hypothesis

H₀: The values of X₁, X₂, X₃, and X₄, are uniform in the sample units.

Limitations of the Study

This study is confined to five cement companies in India. The result cannot be generalized for the companies in industries and the result is only for five years from 2009-2010 and 2013-2014.

ANALYSIS AND INTERPRETATION

Table - 1: Financial Leverage of Acc

| Year | Debt Ratio | Debt-Equity Ratio | Interest Coverage Ratio | Interest To EBIT Ratio |
|-----------|------------|-------------------|-------------------------|------------------------|
| 2009-2010 | 0.07 | 0.09 | 26.74 | 0.03 |
| 2010-2011 | 0.06 | 0.08 | 16.9 | 0.05 |
| 2011-2012 | 0.02 | 0.05 | 15.79 | 0.07 |
| 2012-2013 | 0.01 | 0.01 | 11.81 | 0.08 |
| 2013-2014 | 0 | 0 | 14.72 | 0.06 |

ACC has a very low level of debt. It ranges from 0 to 0.09. In the year 2009-2010 it had debt around 0.09 and gradually decreased to 0.01 in the year 2012-2013. No debt had been employed in the financial year 2013-2014. Interest coverage ratio

11.81 to 26.74 over the study period. Interest coverage ratio which indicates the company has enough potential to service its debts.

Table- 2: Financial Leverage of KCP

| Year | Debt Ratio | Debt-Equity Ratio | Interest Coverage Ratio | Interest To EBIT Ratio |
|-----------|------------|-------------------|-------------------------|------------------------|
| 2009-2010 | 0.5 | 0.4 | 10.53 | 0.11 |
| 2010-2011 | 0.88 | 0.51 | 5.02 | 0.24 |
| 2011-2012 | 0.99 | 0.48 | 3.23 | 0.44 |
| 2012-2013 | 0.97 | 0.5 | 2.27 | 0.87 |
| 2013-2014 | 1.12 | 0.55 | 1.03 | 36.9 |

KCP has a very moderate level of debt. It ranges from 0.4 to 0.55. In the year 2009-2010 it had debt around 0.4 and gradually increased to 0.51 in the year 2010-2011. It had slight fluctuation during the entire study period. The interest coverage ratio ranges from 10.53 to 1.03 over the study period. In the year 2013-2014 Interest coverage ratio indicates that the company does not provide much coverage to debt holders because of its low EBIT..

Table - 3: Financial Leverage of IC

| Year | Debt Ratio | Debt-Equity Ratio | Interest Coverage Ratio | Interest To EBIT Ratio |
|-----------|------------|-------------------|-------------------------|------------------------|
| 2009-2010 | 0.63 | 0.34 | 4.72 | 0.21 |
| 2010-2011 | 0.65 | 0.37 | 1.43 | 0.61 |
| 2011-2012 | 0.73 | 0.39 | 2.31 | 0.43 |
| 2012-2013 | 0.79 | 0.42 | 1.82 | 0.54 |
| 2013-2014 | 0.87 | 0.45 | 0.85 | 0.84 |

IC has a very moderate level of debt. It ranges from 0.34 to 0.45. In the year 2009-2010 it had debt around 0.34 and gradually increased over the period of study. Interest coverage ratio ranges from 4.72 to .85 over the study period. Interest coverage ratio indicates that the company was servicing its debt without any interruptions.

Table - 4: Financial Leverage of PC

| Year | Debt Ratio | Debt-Equity Ratio | Interest Coverage Ratio | Interest To EBIT Ratio |
|-----------|------------|-------------------|-------------------------|------------------------|
| 2009-2010 | 0.44 | 0.68 | 7.78 | 0.28 |
| 2010-2011 | 0.83 | 0.69 | 2.25 | 0.52 |
| 2011-2012 | 1.05 | 0.71 | 0.76 | 1.18 |
| 2012-2013 | 1.32 | 0.72 | 0.58 | 1.36 |
| 2013-2014 | 1.66 | 0.74 | 0.48 | 1.56 |

PC has a high level of debt. It ranges from 0.68 to 0.74. In the year 2009-2010 it had debt around 0.68 and gradually increased to 0.74 in the year 2013-2014. Interest coverage ratio was high in 2009-2010 and decreased to 0.48 over the study period. Interest coverage ratio from 2011-2012 to 2013-2014 indicates that the company does not provide much coverage to debt holders because of its low EBIT.

Table - 5: FINANCIAL LEVERAGE OF RC

| Year | Debt Ratio | Debt-Equity Ratio | Interest Coverage Ratio | Interest To EBIT Ratio |
|-----------|------------|-------------------|-------------------------|------------------------|
| 2009-2010 | 1.78 | 0.62 | 4.5 | 0.22 |
| 2010-2011 | 1.63 | 0.61 | 3.12 | 0.32 |
| 2011-2012 | 1.45 | 0.56 | 4.5 | 0.22 |
| 2012-2013 | 1.22 | 0.52 | 4.28 | 0.23 |
| 2013-2014 | 1.15 | 0.54 | 1.7 | 0.55 |

RC has a moderate level of debt. It ranges from 0.54 to 0.62. In the year 2009-2010 it had debt around 0.62 and gradually decreased to 0.54 in the year 2013-2014. Interest coverage ratio 4.281 to 1.7 over the study period. It decreased from 4.5 to 1.7 during the period of study. Interest coverage ratio indicates that the company has enough potential to service its debts.

Table - 6 : Debt-Ratio

| YEAR | ACC | KCP | IC | PC | RC | MEAN | SD |
|-----------|------|------|------|------|------|------|------|
| 2009-2010 | 0.07 | 0.5 | 0.63 | 0.44 | 1.78 | 0.68 | 0.65 |
| 2010-2011 | 0.06 | 0.88 | 0.65 | 0.83 | 1.63 | 0.81 | 0.56 |
| 2011-2012 | 0.02 | 0.99 | 0.73 | 1.05 | 1.45 | 0.85 | 0.53 |
| 2012-2013 | 0.01 | 0.97 | 0.79 | 1.32 | 1.22 | 0.86 | 0.52 |
| 2013-2014 | 0 | 1.12 | 0.87 | 1.66 | 1.15 | 0.96 | 0.61 |
| MEAN | 0.03 | 0.89 | 0.73 | 1.06 | 1.45 | | |
| SD | 0.03 | 0.24 | 0.09 | 0.47 | 0.27 | | |

The debt ratio of ACC is extremely low when compared to other companies. PC and RC have high ratios. The use of debt is high in case of PC and RC. Table 6 shows that RC has the highest mean value of debt ratio 1.45 among the other companies. The ratio measures the use of debt by the company. The next one is PC showing the mean value of 1.06. But RC has a decreasing trend in debt ratio and PC has an increasing trend.

Table - 7: ANOVA -Debt Ratio

| | Sum of Squares | df | Mean Square | F | Sig. |
|----------------|----------------|----|-------------|--------|------|
| Between Groups | 5.411 | 4 | 1.353 | 19.133 | .000 |
| Within Groups | 1.414 | 20 | .071 | | |
| Total | 6.825 | 24 | | | |

The table displays the result of overall analysis of variance relating to debt ratio of cement companies in India. The calculated F value is higher than the F critical value, so we can reject the null hypothesis of equal means. That is the means of the ratios of selected companies are not uniform in sample units.

Table - 8: DEBT-EQUITY RATIO

| YEAR | ACC | KCP | IC | PC | RC | MEAN | SD |
|-----------|------|------|------|------|------|------|------|
| 2009-2010 | 0.09 | 0.4 | 0.34 | 0.68 | 0.62 | 0.43 | 0.21 |
| 2010-2011 | 0.08 | 0.51 | 0.37 | 0.69 | 0.61 | 0.45 | 0.22 |
| 2011-2012 | 0.05 | 0.48 | 0.39 | 0.71 | 0.56 | 0.44 | 0.23 |
| 2012-2013 | 0.01 | 0.5 | 0.42 | 0.72 | 0.52 | 0.43 | 0.23 |
| 2013-2014 | 0 | 0.55 | 0.45 | 0.74 | 0.54 | 0.46 | 0.25 |
| MEAN | 0.05 | 0.49 | 0.39 | 0.71 | 0.57 | | |
| SD | 0.04 | 0.06 | 0.04 | 0.02 | 0.04 | | |

The debt-equity ratio of ACC is extremely low when compared to other companies. RC have high ratios compared to others companies. The use of debt is high in case of PC and RC. Table 8 shows that PC has the highest mean value of debt-equity ratio .71 among the companies. The ratio measures the use of debt to equity by the company. But RC has a decreasing trend in debt-equity ratio and PC has an increasing trend. More deviation is seen in KPC.

Table - 9: ANOVA –DEBT-Equity Ratio

| | Sum of Squares | df | Mean Square | F | Sig. |
|----------------|----------------|----|-------------|---------|------|
| Between Groups | 1.242 | 4 | .310 | 172.481 | .000 |
| Within Groups | .036 | 20 | .002 | | |
| Total | 1.278 | 24 | | | |

Table 9 is showing the result of one-way ANOVA for debt-equity ratio. The calculated F value is far away from the F critical value, so we can reject the null hypothesis. That is the means of the ratio of the selected companies are not uniform in the sample units.

Table - 10: Interest Coverage Ratio

| YEAR | ACC | KCP | IC | PC | RC | MEAN | SD |
|-----------|-------|-------|------|------|------|-------|------|
| 2009-2010 | 26.74 | 10.53 | 4.72 | 7.78 | 4.5 | 10.85 | 9.22 |
| 2010-2011 | 16.9 | 5.02 | 1.43 | 2.25 | 3.12 | 5.74 | 6.38 |
| 2011-2012 | 15.79 | 3.23 | 2.31 | 0.76 | 4.5 | 5.32 | 5.32 |
| 2012-2013 | 11.81 | 2.27 | 1.82 | 0.58 | 4.28 | 4.15 | 4.15 |
| 2013-2014 | 14.72 | 1.03 | 0.85 | 0.48 | 1.7 | 3.76 | 3.76 |
| MEAN | 17.19 | 4.42 | 2.23 | 2.37 | 3.62 | | |
| SD | 5.66 | 3.72 | 1.49 | 3.11 | 1.22 | | |

Table 10 depicts the interest coverage ratio of selected cement companies in India. Interest coverage is extremely high in case of ACC in the year 2009-2010 and gradually decreased till 2012-2013 and increased 2013-2014. ACC has the highest mean value of 17.19 and standard deviation of 5.66. Highest industry average is recorded in the year 2009-2010. IC recorded lowest mean value of 2.23.

Table - 11: ANOVA- Interest Coverage Ratio

| | Sum of Squares | df | Mean Square | F | Sig. |
|----------------|----------------|----|-------------|--------|------|
| Between Groups | 804.241 | 4 | 201.060 | 16.967 | .000 |
| Within Groups | 237.005 | 20 | 11.850 | | |
| Total | 1041.246 | 24 | | | |

Table 11 shows the calculated F value is higher than the F critical value, so we can reject the null hypothesis of equal means. That is the means of the ratio of the selected companies are not uniform in the sample units.

Table 12: Interest to EBIT Ratio

| YEAR | ACC | KCP | IC | PC | RC | MEAN | SD |
|-----------|------|-------|------|------|------|------|-------|
| 2009-2010 | 0.03 | 0.11 | 0.21 | 0.28 | 0.22 | 0.17 | 0.09 |
| 2010-2011 | 0.05 | 0.24 | 0.61 | 0.52 | 0.32 | 0.35 | 0.22 |
| 2011-2012 | 0.07 | 0.44 | 0.43 | 1.18 | 0.22 | 0.47 | 0.43 |
| 2012-2013 | 0.08 | 0.87 | 0.54 | 1.36 | 0.23 | 0.62 | 0.51 |
| 2013-2014 | 0.06 | 36.9 | 0.84 | 1.56 | 0.55 | 7.98 | 16.17 |
| MEAN | 0.06 | 7.71 | 0.53 | 0.98 | 0.31 | | |
| SD | 0.02 | 16.32 | 0.23 | 0.55 | 0.14 | | |

Table 12 displays the mean value of interest to EBIT ratios KCP has highest mean value of interest to EBIT ratio and ACC show the lowest mean value of .06. In the year 2013-2014 the industrial average was high to the extent of 7.19 .

Table 13: ANOVA- Interest to EBIT Ratio

| | Sum of Squares | df | Mean Square | F | Sig. |
|----------------|----------------|----|-------------|------|------|
| Between Groups | 212.198 | 4 | 53.050 | .995 | .433 |
| Within Groups | 1066.775 | 20 | 53.339 | | |
| Total | 1278.973 | 24 | | | |

Table 12 shows the calculated F value is .995. It is less than the critical F value, while it is different in case of other ratios. The null hypothesis is accepted. So the values are showing degree of uniformity .

CONCLUSION

In general, this paper makes an attempt to test capital structure (the use of financial leverage) leads to financial distress in the selected cement companies in India. Companies differ in the use of financial leverage since it depends on number of factors such as the size, nature of product, capital intensity, technology etc. . You may observe variations in the use of financial leverage by selected cement companies in India. In the year 2013-2014, ACC did not use any debt . KCP has a very moderate



level of debt. ACC, IC and RC have enough potential to service its debts. Analysis of KCP and PC indicates the company does not provide much coverage to debt holders because of its low EBIT. So there is a probability of financial distress and the company has to look into the affairs of the company. Greater the level of debt and the larger the debt servicing burden associated with it, has the higher the probability of financial distress. So, there is a probability of financial distress in case of KCP cement and Prism cements.

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